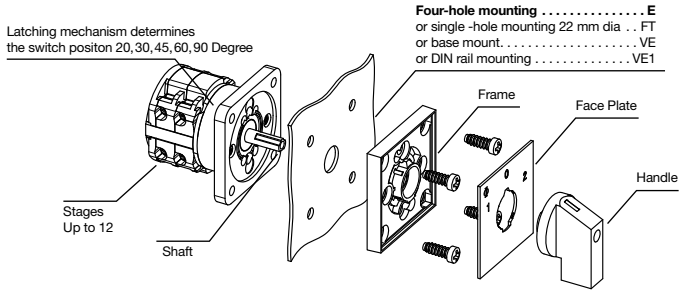
Construction Data

The load switches of the C, CA and CAD-series offer a solution for most cam switch applications. Different contact designs, contact materials and terminals allow for their use as control switches, instrumentation switches and motor control switches, as well as in electronic circuitry and in aggressive environments according to IEC 60947-3 and VDE 0660 part 107.

The stage is the basis for all switches and can be supplied with a maximum of 2 contacts. The terminals are accessible from the side. CA and CAD switches are supplied with open terminals to facilitate wiring and are protected against accidental finger contact according to EN 50274, VDE 0660 part 514 and DGUV V3. Switches up to type CA25B are supplied with captive screws with clamping plates. The switch types CA40-CA63 are supplied with box terminals. Captive plus-minus terminal screws and integrated screwdriver guides facilitate wiring.

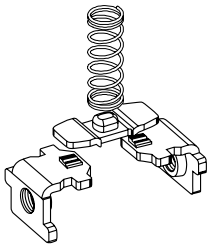
If a positive manual operation or a higher DC rating is required, many of these switches can be fitted with a snap action latching mechanism - suffix „S“ - to the switch type.

The cam-operated switches of the L-series are continuous current rated for off-load switching. They may be used to switch resistive or low inductive loads.



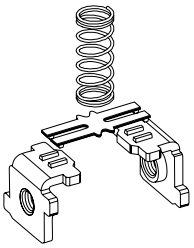
Special Contact Systems

CA4/CA4-1



High contact reliability by multiple cross-point contacts, electronic compatible.

CAD4-1/CAD11/CAD12



High contact reliability by H-bridge design with “cross-wire“ contacts. The contact system with gold-plated contacts (CAD12 with silver contact) allows for low voltages, electronic compatible.

Type	Size	Possible Switching Angles	Max. No. of Stages
CA4, CA4-1, CAD4-1	S00	30°, 45°, 60°, 90°	9
CA10-CA25	S0	30°, 45°, 60°, 90°	12
CA10S-CA25S	S0	60°, 90°	on request
CAD11, CAD12	S0	30°, 45°, 60°, 90°	12
CA10B-CA25B	S1	30°, 45°, 60°, 90°	12
C26, C32, C42	S1	20°, 30°, 45°, 60°, 90°	12
C26S, C32S, C42S	S1	60°	on request
CA40, CA50, CA63	S1	30°, 45°, 60°, 90°	12
C43, C80, C125, C200-4	S2	20°, 30°, 45°, 60°, 90°	12
C315	S3	30°, 45°, 60°, 90°	12
L350, L351, L630, L631	S2	30°, 45°, 60°, 90°	12
L1000			
L400, L600, L800, L1200, L1600, L2000	S3	30°, 45°, 60°, 90°	12

CA and CAD Switches (CA4-CA25B)

CA Switches (CA40-CA63)

C Switches

L Switches

Above illustrates the standard terminal positions.

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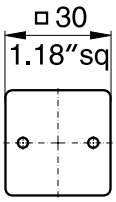
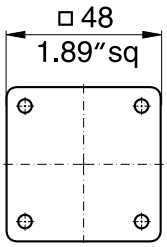
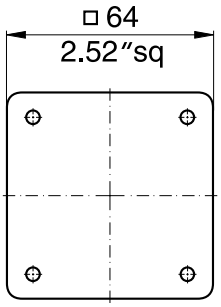
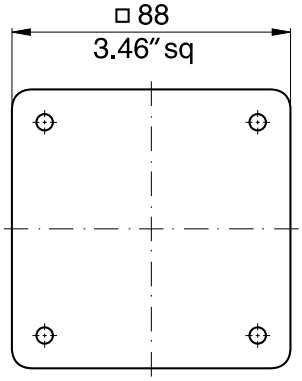
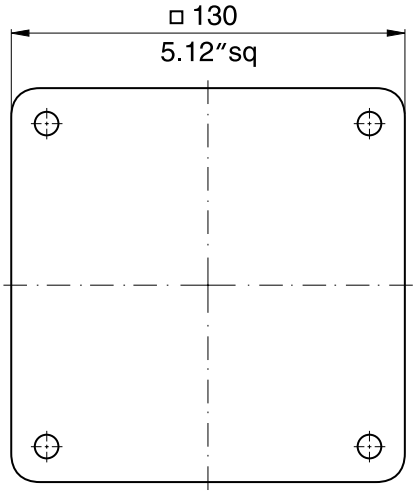
Switch Size	Type	According to IEC 60947-3/VDE 0660 part 107			
		Insulation Voltage[1]	Thermal Current	Motor Rating 3 x 380 V-440 V	
		U_i	I_u/I_{th}	AC-23	AC-3
		V	**A**	**kW**	**kW**
S00 	**CA4**	440	10	3	2,2
	CA4-1	440	10	3	2,2
	CAD4-1	440	5	-	-
S0 	**CA10**	690	20	7,5	5,5
	CA11	690	20	7,5	5,5
	CA20	690	25	11	7,5
	CA25	690	32	15	11
	CAD11	600	6	-	-
	CAD12	600	6	-	-
S1 	**CA10B**	690	20	7,5	5,5
	CA11B	690	20	7,5	5,5
	CA20B	690	25	11	7,5
	CA25B	690	32	15	11
	C26	690	32	15	11
	C32	690	50	22	15
	C42	690	63	30	18,5
	CA40	690	40	18,5	15
	CA50	690	50	22	18,5
	CA63	690	63	30	18,5
S2 	**C43**	690	63	30	18,5
	C80	690	115	45	30
	C125	690	150	75	37
	C200-4	690	200	75	37
	L350	690	350	90	37
	L351	690	350	90	37
	L630	690	630[2]	90	37
	L631	690	630[2]	90	37
	L1000	690	1000[2]	90	37
S3 	**C315**	690	315	132	55
	C316[3]	1000	315	132	55
	L400	690	500	132	55
	L600	690	800[2]	132	55
	L800	690	1100[2]	132	55
	L1200	690	1450[2]	132	55
	L1600	690	1900[2]	132	55
	L2000	690	2400[2]	132	55

For further technical details, refer to pages 44-47.
To furnish with gold contacts and quick connects see page 6.

[1]Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. [2]Ambient temperature 35 °C max. [3]Additional switch functions on request.

How to order

Disconnectors and Main Switches according to IEC 60947-3 see Catalog 500

Three types of data (shown below) are required for ordering Blue Line cam-operated switches. Code numbers for ordering are shown in this catalog.

1. Type of Switch

The type of switch required may be easily selected by referring to the table on page 5 which shows the thermal current, power rating and dimensions of each switch. For further technical details, refer to pages 44-47. Variations of contacts and terminals are shown below.

2. Switch Function

The code numbers for standard switches shown on pages 8-32 indicate the switch function, face plate, handle and any optional extras.

Additional coding to modify type and color of handle and face plate is explained below.

3. Type of Mounting

Types of mounting are shown on pages 33-39. Catalog **101** describes enclosures and optional extras.

Specify the mounting code to indicate required mounting.

CA10	A202	VE

Type of Switch

Extending the switch type coding the following combinations will define:

Amendment	Definition	For switch types
-1	with gold contacts[1]	CA4-1, CA4N-1, CA10-1, CA11-1, CA10B-1, CA11B-1, CAD4-1
-4	with quick connects	CA4-4
B[2]	S0 switches with latching mechanism size S1	CA10B, CA11B, CA25B, CAD11B, CAD12B
C[2]	S1 switches with latching mechanism size S2	CA40C, CA50C, CA63C
L	with lockout-relay w/o manual release for std. sw.	CA10L, C25L, C26L, CA40L, CA50L, CA63L
M	with lockout-relay with manual release for std. sw.	CA10M, C25M, C26M, C42M, CA40M, CA50M, CA63M
X	with power failure release	CA10X, CA20X, CA25X, C26X, C32X, C42X, CA40X, CA50X, CA63X
Y	with power failure release and trip-free release	CA10Y, CA20Y, CA25Y
S[2]	with snap action	CA10S, CA20S, CA25S with 60° or 90° switching C26S, C32S, C42S, CA40S, CA50S, CA63S with 60° switching
R	with spring return latching mechanism	CA10R, CA25R, CAD11R, CAD12R

Example: Coding for switch type **CA10** with gold contacts is **CA10-1.**

Handles, Face Plates and Optional Extras

The handles for standard switches shown on pages 8-32 are suitable for mounting units with four hole mounting. Alternative types of handles available are illustrated on page 42, and mounting units on pages 31-37.
When a handle, face plate or optional extra is required but not covered by the dash number, the code number for the selected component should be entered separately. A comprehensive range of available standard face plates is illustrated on pages 40 and 41. Non-standard or special face plate engravings are available at extra cost.
The large number of optional extras and enclosures is covered in Catalog **101**.

Switch Size

Blue Line switches are available in sizes S00, S0, S1, S2 and S3. These size codes indicate the dimensions of the mounting, the face plate and the handle, as well as the size of optional devices and enclosures.
Page 5 lists these sizes and the various switch types they include.

[1]Technical data on request. [2]Additional length for switches with B, C, S, amendments refer page 54.

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Function	Escutch. Plate	Type/Handle CA4 CA4-1 CAD4-1	CAD.. CA10- CA25	CA10B- CA25B	CA40 C26- C315	Code	Stages	Connection Diagram

Double-throw Switches with Spring Return to Center

Dimensions p. 56

1 pole with spring return 2 pole to center 3 pole	F025				[2] [3]	A214 A215 A216	1 2 3	1-3 pole
1 pole with spring return 2 pole from left to center 3 pole	F261					A320 A321 A322	1 2 3	1-3 pole

General Application Switches

1 pole 2 Gang 2 pole Switching sequence: 3 pole 0, A, A+B	F075					A310 A312 WAA314	1 2 3	1 pole 2 pole 3 pole
1 pole 3 Gang 2 pole Switching sequence: 3 pole 0, A, A+B, A+B+C	F001					A311 WAA313 WAA315	2 3 5	1 pole 2 pole 3 pole
1 pole 2 Gang 2 pole Series switching 3 pole Switching sequence: 0, A, B, A+B	F001					WAA330 WAA331 WAA332	1 2 3	1 pole 2 pole 3 pole
2 pole 2 Gang Series-parallel Switching Switching sequence: 0, A+B series, A, A+B parallel	F001					WAA339	2	

[1]not available for switch type CA25 [2]not available for switch type C315 [3]available only up to switch type CA63

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Selection Data																			
			CA4 CA4-1	CA10 CA10B	CA11 CA11B	CA20 CA20B	CA25 CA25B	C26	C32	C42 C43	CA40	CA50	CA63	C80	C125	C200-4	C315 C316	
Rated Insulation Voltage U_i	IEC 60947-3, EN 60947-3[1] VDE 0660 part 107[1]	V	440	690	690	690	690	690	690	690	690	690	690	690	690	690	690	690/1000
	SEV[4]	V	380	660	660	660	690	660	660	660	690	690	690	660	660	–	660	
	UL/Canada	V	300	300	600	600	300	600	600	600	600	600	600	600	600	–	600	
	CEE/NEMKO	V	400/380	380	400	400	–	400	400	400	–	–	–	400	–	–	–	
	min. voltage								on request									
Rated Impulse Withstand Voltage U_{imp}		kV	4	6	6	6	6	6	6	6	6	6	6	6	6	6	6/8	
Rated Thermal Current I_u/I_{th}	IEC 60947-3, EN 60947-3 VDE 0660 part 107	A	10	20	20	25	32	32	50	63	40	50	63	115	150	200	315	
	SEV[3] 380 V	A	10	16	16	25	32	32	40	63	40	50	63	100	150	–	315	
	660 V	A	–	12	12	25	32	32	40	63	40	50	63	–	–	–	315	
	UL/Canada	A	10	20	20	30	30	40	50	65	45	55	65	100	150	–	240	
Rated Operational Current I_e																		
AC-21A Switching of resistive loads, including moderate overloads	IEC 60947-3, EN 60947-3 VDE 0660 part 107 690 V	A	10	20	20	25	32	32	40	63	40	50	63	100	150	200	315	
AC-1 Resistive or low inductive loads	SEV[4] 380 V	A	10	16	16	25	32	32	40	63	40	50	63	100	150	–	315	
	660 V	A	–	12	12	20	32	32	40	63	40	50	63	–	–	–	315	
AC-22A Switching of combined resistive or low inductive loads including moderate overloads	IEC 60947-3, EN 60947-3 VDE 0660 part 107 220 V-500 V	A	10	20	20	25	32	32	40	63	40	50	63	100	150	150	315	
	660 V-690 V	A	–	20	20	25	32	32	40	63	40	50	63	100	125	125	125	
AC-15 Switching of control devices, contactors, valves etc.	IEC 60947-5-1, EN 60947-5-1 VDE 0660 part 200 220 V-240 V	A	2,5	6	6	8	12	14	16	–	14	16	16	–	–	–	–	
	380 V-440 V	A	1,5	4	4	5	6	6	7	–	6	7	7	–	–	–	–	
Pilot Duty	UL/Canada[3] Heavy	VAC	A300	A300	A600	A600	A300	A600	A600	A600	A600	A600	A600	–	–	–	A600	
Ampere Rating Resistive or low inductive loads	UL/Canada[3]	A	10	20	20	30	30	40	50	65	45	55	60	100	150	–	240	
Resistive load/motor load	CEE	A	4/2	10/6	10/6	16/10	–	25/10	32/10	40/10	–	–	–	63/10	–	–	–	
	NEMKO	A	6/4[2]	10/6	–	20/10	–	–	–	–	–	–	–	–	–	–	–	
Breaking capacity	220 V-240 V	A	50	150	150	200	280	280	380	550	290	330	440	860	1100	1100	2000	
	380 V-440 V	A	50	150	150	200	250	250	360	550	290	330	440	860	1100	1100	2000	
	660 V-690 V	A	–	80	80	125	150	150	270	365	170	200	260	400	490	490	340	
Power loss per contact at I_u		W	0,4/0,9	0,9	0,9	0,9	0,7	1.3	1.3	1.7	1	1,8	2,8	5,8	3,8	6,7	17	
Resistance to vibration			min. 4 g, 2-100 Hz, 1,6 mm								on request							
Resistance to shock			min. 5 g, 6 ms								min. 5 g, 30 ms							
Short Circuit Protection Max. fuse size	(gG-characteristic)	A	10	25	25	35	35	50	63	80	50	63	63	125	200	200	315	
Rated short-time withstand current	(1s-current)	A	60	140	140	280	480	350	800	1000	950	950	950	1300	2000	2000	4200	
Min. Ambient Temperature of Stages			-25 °C (valid only without optional extra, C315/C316 on request)															
Max. Ambient Temperature of Stages[5, 7] open at 100 % I_u/I_{th}			55 °C during 24 hours with peaks up to 60 °C															
enclosed at 100 % I_{the}			35 °C during 24 hours with peaks up to 40 °C															

[1]Valid for lines with grounded common neutral termination, overvoltage category III, pollution degree 3. Values for other supply systems on request. [2]Valid for CA4 only. [3]International Standards and Approvals, refer to page 43. [4]For electromagnetic optional extras see additional data in Catalog 101. [5]Storage temperature: -40 °C to 85 °C (in case of temperature below -5 °C no shock load permissible).

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